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DIAGNOSIS OF BILATERAL PARIETO-CALLOSAL BRAIN TUMORS

[Following is the translation of an article by L. O. Korst entitled K Diagnostike Dvustoronnikh Temenno-Mozolistykh Opukholey Mozga, (English version above), Vol. XXIV, No. 3, July 1960, Moscow, pages 28-31.]

Bilateral parieto-callosal tumors are very difficult to diagnose. In the literature there are individual descriptions of such cases (Yu. V. Konovalov and A. Ya. Podgornaya, 1938; Anton, 1899 and others).

Yu. V. Konovalov and A. Ya. Podgornaya have described tumors of the posterior parts of the corpus callosum with extenstion to the adjacent parietooccipital areas. In the patients, gross disorders of memory, particularly for recent events, apraxia, chiefly of the constructive type, and a number of spatial disorders against a background of preservation of the patient's personality were most prominent.

In the patient described by Anton there was an intracerebral tumor which included both lower parietal lobes, more on the right, and the entire posterior portion of the corpus callosum; there was a paraparesis of the lower extremities with a reduction in protopathic sensation, amimia. The eye movements were free on both sides, but the patient could not fixate objects. Spatial orientation was impaired on the right and on the left and there was also an impairment of binaural hearing. Orientation was

maintained with respect to time, place and person; he had good judgment with respect to his own condition, understood everything, but his there was a marked loss of memory for current events; he did not know what he had just done, with whom he had spoken, what he had eaten, etc.

Of the patients who did not have any tumors, Bonhoeffer in 1915 described a patient with two foci of softening in both inferior parietal lobules, which included also the posterior parts of the first and second temporal convolutions with atrophy of the portion of the corpus callosum corresponding to it; because the patient had signs of sensory aphasia, the examination was difficult, but it was still possible to detect disorientation in space and ideational apraxia.

R. Ya. Golant in 1940 described a case of cortical atrophy, chiefly of the parietal lobes, more on the right, with a corresponding degeneration of the corpus callosum. The main and earliest symptom was a disturbance in attention, a disorder of the capacity to shift attention from one object to another. The patient could not make necessary movements with his eyes, head, body so as to see an object required or to feel it; there was disorientation on the right and on the left. A marked reduction in memory was noted both for past and current events. The patient could not see two objects simultaneously or two persons in a room and did not hear one of them.

Tumors of the parieto-callosal area, just as

fronto-callosal tumors, either grow out of the corpus callosum and spread to both hemispheres or begin to grow in the white matter of one hemisphere and spread through the corpus callosum to the other. These are chiefly multiform spongioblastomas or astrocytomas, usually with polymorphic cellular structures or undifferentiated. Hence, the duration of the disease was no more than a year; it usually begins with headaches rather than with local symptoms characteristic of involvement of this area.

The symptomatology is expressed chiefly on the side of the hemisphere where the nodule is larger; such tumors are frequently considered unilateral.

In the case of a tumor which includes only the posterior portion of the corpus callosum, disturbances in the psyche may be entirely absent, and a very definite syndrome is demonstrated in which very coarse and distinctive disorders of memory are most prominent. The latter are associated with disturbances in attention and in spatial perception in the most varied manifestations. Thus, memory disorders consist in the fact that the patient forgets everything that occurs in the present. He can tell his history but does not know what he did two minutes ago, with whom he spoke, who was near him. Sometimes, patients are in a very serious condition, confused, generally inhibited because of considerably increased intracranial pressure, and a detailed examination of memory is very

difficult. Then, either dehydration with elimination of the great increase in intracranial pressure or the examination data found in other institutions, before his admission to the Institute, are of assistance. In addition, if the patient already has considerable mental disorders in connection with the increased intracranial pressure or with the growth of the tumor forward along the corpus callosum, with improvement in the patient's condition it is possible to demonstrate the nature of the memory disorders in greater detail.

If the patient has an involvement of the fronto-callosal systems the mental symptoms are unchanged under any circumstances; the patient always remains without spontaneity, disoriented, inhibited, without judgment, untidy, etc. In short, the inertia of higher nervous activity which is always observed in involvement of frontal systems and is manifested both in thinking and speech, in movements and in the entire behavior of the patient is never eliminated with involvement of the frontal systems but can be reduced with involvement of parieto-callosal systems. Hence, examination of other symptoms characteristic of involvement of the parietal systems, like, for example, sensation and other gnostic functions is possible; this is impossible if the patient is markedly altered mentally or is in a very serious condition. Thus, for example, in the case history it may frequently be read that it is impossible to investigate sensation because of the mental condition of the patient; nevertheless, according to

an abstract from the case history of the previous therapeutic institution one can sometimes be convinced that some time previously the patient was oriented as to his surroundings, but he did not have any disorders of deep sensation or of stereognosis in the hand, etc.

Thus, patient P., who was admitted to the Institute of Neurosurgery in a serious condition with pronounced mental changes had shown a reduction in the superficial and deep sensation on the left as well as on a disturbance in stereognosis on the left in another hospital, a month before his admission. There, it had been noted that the patient had a marked memory disorder for current events; he forgot them after several minutes. Memory for past events was preserved, and he gave his history correctly up to the given year. Afterwards, the patient developed very severe mental changes associated with inertia of all the processes of higher nervous activity. At autopsy, a spongioblastoma multiforme was found which had extended into the white matter of the parietal and occipital lobes, to the entire corpus callosum and which had penetrated into both lateral ventricles in the area of their triangles [the area next to the septum pellucidum].

Neurologically it should be noted that disturbances in movement of the extremities opposite to the main tumor nodule are not so much of the nature of paresis as of parietal ataxia, with awkwardness and slowness of movements. The tone in the extremities is usually increased. Sometimes,

tremor is observed an even attacks of myoclonus. All these symptoms are demonstrated better in the earlier periods of the disease.

Sometimes the patients have hemianopsia, which should also be evaluated in combination with all of the rest of the symptomatology, as occipital rather than temporal.

The patients may show various forms of apraxia, a disturbance in orientation on the right and on the left, digital agnosia, disorientation in space, attention, reading, writing and counting disorders similar to those which occur with involvement of the parietooccipital systems, and other gnostic disorders characteristic of involvement of the parietooccipital systems.

The patients show disturbances in statics and in gait of the trunk ataxia type early, the origin of which is difficult to explain -- it is not known whether it is associated with involvement of the corpus callosum and the parietal radiations or with involvement of the brain-stem, which is involved in the process with these tumors. The same thing applies also to the bilateral pathological reflexes. Because the tumor exerts pressure from above, it primarily influences the corpora quadrigemina, which is expressed in pareses or paralysis of upward gaze, a deterioration in the pupillary reaction to light; in addition, a disturbance s is observed in caloric excitability, up to a complete depression of it, bilateral pathological reflexes, less often nystagmus and involvement of the

cranial nerves. All these signs also vary depending on the degree of increase in intracranial pressure.

Not only the size of the tumor itself and the cerebral edema but sometimes also hydrocephalus brought about by compression of the aqueduct of Sylvius may underlie the increase in intracranial pressure in the patient with tumors of parieto-callosal systems.

Despite the considerable increase in intracranial pressure demonstrated clinically, the spinal pressure in these patients usually does not exceed 200-300 millimeters of water, as usually occurs with intracerebral tumors. The spinal fluid is changed depending on the location of the tumor and its nature. If the tumor penetrates into the ventricles or grows subarachnoidally, there may be considerable protein and a high cell count and sometimes xanthochromia in the spinal fluid.

In parieto-callosal tumors electroencephalography contributes little to clarifying the diagnosis and to determining the localization of the tumor. Usually, there are marked diffuse changes in the action currents from both hemispheres, sometimes with a predominance of pathological waves on the side of the larger nodule or in the frontal areas.

On X-ray films of the skull nothing specific is found. Only with considerable increase in intracranial pressure are secondary changes noted on the part of the sella turcica, the bones at the base and vault of the skull and the vascular system.

Ventriculography may give a very distinct picture, but in connection with the big increase in intracranial pressure it is not always possible, or the air penetrates only into a single ventricle. With penetration of the air into both ventricles it is found that the body and posterior horns of the lateral ventricles are compressed from above and the ventricles are spread apart in their central and posterior portions.

Everything which has been stated above can be demonstrated through the following example.

In patient P., against the background of signs of marked increase in intracranial pressure with stasis and hemorrhages in the optic fundus and paresis of upward gaze, gross memory disorders were prominent. The patient was completely intact mentally, but he quickly forgot all events which occurred in the present. The patient did not remember about whom he had been speaking two minutes ago, what he had just eaten, what article had been shown to him. If the physician left the room for a minute and returned immediately the patient did not remember that the physician had been there previously and about what they had been talking. However, he told his history in quite some detail and correctly. Hence, there was disorientation in time and place but there was a complete preservation of the patient's judgment as to his own disorientation. Against this background, optic-gnostic disorders were slight but distinct; thus, for

example, he recognized letters, but he did not always understand them; there was constructive [motor] apraxia; there were pronounced spatial disorders; he was confused as to his ward, and did not know his left and right sides. There were difficulties in positional and spatial praxis. There were no sensory or motor disorders.

After investigating the patient, A. R. Luriya gave the following conclusion: "The nature of the spatial disorders, the signs of spatial apraxia, the elements of optic and motor amnesia give us the grounds for suspecting involvement of the inferior parietal and the borderline occipital areas of the left hemisphere. The central syndrome of memory disorder with respect to his we own experiences cannot stem from involvement of the left hemisphere alone and probably signifies the relationship of the process to the posterior portions of the corpus callosum with participation of the posterior portions of the right hemisphere".

For the purpose of making the diagnosis more precise was a ventriculography was performed on the patient. The air penetrated but little into the ventricles; however, the irregular outlines of the posterior portions of the ventricles, the pressure on them from above and some spotty shadows in the upper portions attracted attention. In the ventricular fluid the protein was 1.05 per thousand; the cell count was 71/3; in the spinal fluid, the protein was 1.15 per thousand and the cell count, 155/3. [The upper number indicates wbc; the lower number, rbc].

At autopsy a spongioblastoma multiforme was found which occupied the posterior portions of the corpus callosum, growing into both parietal lobes, separating the ventricles and growing into them.

Therefore, distinctive and marked memory disorders for current events, combined with a disturbance in spatial analysis and synthesis and sensory disorders against the background of considerable increase in intracranial pressure with brain-stem symptoms are most prominent in the clinical picture of bilateral parieto-callosal tumors.

Bibliography

1. Golant R. Ya. Nevropatol. i psikhiatr. /Neuropathology and Psychiatry/, 1940, Vol. 9, No. 12, page 3.

2. Konovalov Yu. V., Podgornaya A. Ya. Vopr. neyrokhir. /Problems of Neurosurgery/, 1938, No. 1, page 19.

3. Anton D., Wien. klin. Wschr., 1899, Vol. 12, page 1193.

4. Bonhoeffer K., Psychiat. u. Neurol., 1915, Vol. 37, page 17.

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